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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

John D. Hottovy

U.S. Serial No. 10/699,151

Filed: October 31, 2003

For: METHOD AND APPARATUS
FOR REDUCING REACTOR
FINES

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Art Unit: 1723

Examiner: Cheung, William K.

Atty. Docket:

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December 18, 2006
Date

Helen Tinsley
Helen Tinsley

Sir:

APPEAL BRIEF PURSUANT TO 37 C.F.R. §§ 41.31 AND 41.37

This Appeal Brief is being filed in furtherance to the Notice of Appeal mailed on October 10, 2006, and received by the Patent Office on October 16, 2006. Since December 16, 2006, fell on Saturday, this Appeal Brief is believed to be timely filed with no extension fees. The Commissioner is authorized to charge the requisite fee of \$500.00 for this Appeal Brief, and any additional fees which may be necessary to advance prosecution of the present application, to the credit card listed on the attached PTO-2038. If the PTO-2038 is missing, if the amount listed thereon is insufficient, or if the amount is unable to be charged to the credit card for any other reason, the Commissioner is authorized to charge Deposit Account No. 06-1315; Order No. CPCM:0020/FLE (210330US00).

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1. **REAL PARTY IN INTEREST**

The real party in interest is Chevron Phillips Chemical Company LP, the Assignee of the above-referenced application by virtue of the executed Assignment, on reel 015102, frame 0238, and the Assignee will be directly affected by the Board's decision in the pending appeal.

2. **RELATED APPEALS AND INTERFERENCES**

Appellant is unaware of any other appeals or interferences related to this Appeal. The undersigned is Appellant's legal representative in this Appeal.

3. **STATUS OF CLAIMS**

All pending claims 1-11 and 17-22 are currently under rejection and have been rejected at least twice, and, thus, are the subject of this appeal.

4. **STATUS OF AMENDMENTS**

Pending claims 1-7, 10, 11, and 17-22 of the present patent application are in their original form. The two remaining pending claims 8 and 9 were amended by Appellant (to place the present patent application in condition for appeal) in the last Response, which was submitted with the most recent Notice of Appeal mailed on October 10, 2006, and received by the Patent Office on October 16, 2006. *See* Amendment and Response to Office Action mailed July 10, 2006. Although the Examiner has not yet indicated whether these amendments were entered, the last Official Action was not final, so Appellant believes that these amendments were timely presented and should be entered as a matter of right.

5. **SUMMARY OF CLAIMED SUBJECT MATTER**

The present application contains two independent claims, namely, claims 1 and 7, both of which have been improperly rejected and, thus, are subject to this Appeal. The subject matter of these independent claims is summarized below.

Claim 1 relates to a polymerization process (e.g., Fig. 1) including polymerizing in a loop reactor (e.g., loop reactor 10) having an inner surface, an olefin monomer (e.g., ethylene) in a liquid medium (e.g., diluent) to produce a fluid slurry comprising solid olefin polymer particles (e.g., polyethylene) in a liquid medium (e.g., diluent and ethylene), wherein the inner surface of the loop reactor (e.g., loop reactor 10) has a root mean square surface roughness less than about 120 micro inches. *See, e.g.*, Application, page 1, ¶ 5; page 2, ¶¶ 10-14; pages 6-7, ¶¶ 24-28.

Claim 7 relates to a polymerization process (e.g., Fig. 1) having: a first polymerization step including polymerizing in a loop reactor (e.g., loop reactor 10) an olefin monomer (e.g., ethylene) in a liquid medium (e.g., diluent) to produce a first product fluid slurry comprising a liquid medium (e.g., ethylene and diluent) and solid olefin polymer particles (e.g., polyethylene) having a melt index less than 0.3 gm/10 min; and a second polymerization step including polymerizing in the loop reactor an olefin monomer (e.g., ethylene) in a liquid medium (e.g., diluent) to produce a second product fluid slurry comprising a liquid medium (e.g., ethylene and diluent) and solid olefin polymer particles (e.g., polyethylene) having a melt index greater than 0.4 gm/10 min. *See, e.g.*, Application, page 1, ¶ 5; page 2, ¶¶ 10-14; pages 4-6, ¶¶ 19-27.

6. **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

A. **First Ground of Rejection for Review on Appeal**

Appellant respectfully urges the Board to review and reverse the Examiner's first ground of rejection in which the Examiner rejected claims 7-11 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellant regards as the invention.

B. **Second Ground of Rejection for Review on Appeal**

Appellant respectfully urges the Board to review and reverse the Examiner's second ground of rejection in which the Examiner rejected claims 1-6 under U.S.C. § 103(a) as being obvious over Rohlfing et al. (U.S. Patent No. 3,244,681). Appellant notes that the Examiner incorrectly employs "Stanley" as the first listed inventor in attributing U.S. Patent No. 3,244,681 to Stanley et al.

C. **Third Ground of Rejection for Review on Appeal**

Appellant respectfully urges the Board to review and reverse the Examiner's third ground of rejection in which the Examiner rejected claims 7-11 and 17-22 under U.S.C. § 103(a) as being obvious over Rohlfing et al. (U.S. Patent No. 3,244,681). Again, Appellant notes that the Examiner incorrectly employs "Stanley" as the first listed inventor in attributing U.S. Patent No. 3,244,681 to Stanley et al.

7. **ARGUMENT**

As discussed in detail below, the Examiner has improperly rejected the pending claims. Further, the Examiner has misapplied long-standing and binding legal precedents and principles in rejecting the claims under Sections 112 and 103. Accordingly, Appellant respectfully requests full and favorable consideration by the Board, as Appellant strongly believes that claims 1-11 and 17-22 are currently in condition for allowance.

First Ground of Rejection – Claim Rejections under 35 U.S.C. § 112

The Examiner rejected claims 7-11 under U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Appellant regards as the invention. Appellant respectfully traverses this rejection. The Examiner asserted that there is insufficient antecedent basis for recitations in dependent claims 8 and 9. Office Action Mailed July 10, 2006, pages 2-3. In addition, the Examiner contended that the recitations in independent claim 7 of a “first polymerization step” and a “second polymerization step” are indefinite. *Id.*, at 3. The Examiner specifically stated:

Without any intermediate step(s) and any indication that the process has been stopped in between the first polymerization step and the second polymerization step, one of ordinary skill would not know the end of the first step and the beginning of the second step. The examiner has considered the loop reactor (Figure 1) of Appellants’ specification. Since Figure 1 only indicates a single loop reactor, how can a polymerization process be carried in two polymerization steps?

Id., at 3.

Legal Precedent

Section 112, second paragraph, is satisfied where a person skilled in the art would *reasonably* understand the claim when read in the context of the specification. *See Marley Mouldings Ltd. v. Mikron Indus., Inc.*, 417 F.3d 1356, 75 U.S.P.Q. 2d 1954 (Fed. Cir. 2005). Indeed, the definiteness of a claim must be analyzed, not in a vacuum, but in light of the content of the particular application's disclosure, the teachings of the prior art, and the claim interpretation of one of ordinary skill in the art at the time the invention was made. *See M.P.E.P.* § 2173.02. A claim is indefinite only when the claim remains insolubly ambiguous without a discernible meaning after all reasonable attempts at construction. *See Metabolite Labs, Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1366, 71 U.S.P.Q.2d 1081, 1089 (Fed. Cir. 2004).

Independent Claim 7

Appellant respectfully contends that one of ordinary skill in the art would clearly understand claim 7, especially in view of the present specification. *See, e.g.*, Application, pages 4-5, ¶¶ 19-23. Such an artisan would appreciate plainly that the claimed first step of producing polymer having a first (lower) melt index may be performed in a polymerization reactor (e.g., loop reactor 10), and that the operating conditions of the polymerization reactor (e.g., loop reactor 10) can then be adjusted to transition to the claimed second step producing polymer having a second (higher) melt index. *See* Application, Figure 1. Exemplary operating conditions that impact melt index of the polymer include reactor temperature, ethylene concentration, reactor residence time, catalyst productivity, and hydrogen concentration, and so forth. *See* Application, page 5, ¶ 20. Further, “[n]umerous methods are well known in the art for

controlling the melt index of the polymer produced.” *Id.* Claim 7 is *not* insolubly ambiguous. Moreover, as explained in the present specification, a purpose of the claimed first and second steps is to smooth the reactor wall, and to therefore, reduce the amount of fine particles or “fines” generated in the subsequent polymer slurry circulating in the reactor. *See, e.g.*, Application, pages 4-5, ¶¶ 19-23.

As discussed in the present specification, reactor walls that are smoother (having a lower friction factor) are less likely to break the circulating polymer particles (upon contact) into smaller particles or “fines.” *See, e.g.*, Application, pages 4-5, ¶¶ 19-23. To smooth the reactor wall so to avoid fines generation, certain embodiments of the present techniques provide a first polymerization step that produces polymer particles having a relatively lower melt index (which are relatively hard and which are believed to scuff and smooth the wall as the polymer slurry circulates in the reactor), and then to provide a second step that produces polymer particles having a higher melt index (which are relatively softer and which may smear and coat rough spots on the wall to further reduce the friction factor of the wall). *See id.* In view of the foregoing, Appellant respectfully requests that the Board direct the Examiner to withdraw the rejection under Section 112 and allow claims 7-11 and 17-22.

Dependent Claims 8 and 9

In view of the amendments to dependent claims 8 and 9 made in the last Response (submitted with the Notice of Appeal), Appellant believes that the Examiner’s assertions of insufficient antecedent basis are moot. *See* Amendment and Response to Office Action mailed

July 10, 2006. Therefore, Appellant respectfully requests that the Board direct the Examiner to withdraw the rejections of claims 8 and 9 based on insufficient antecedent basis and to allow the claims.

Second Ground of Rejection – *Claim Rejection under 35 U.S.C. § 103(a)*

The Examiner rejected claims 1-6 under 35 U.S.C. § 103(a) as obvious over Rohlfing et al. (U.S. Patent No. 3,244,681). Of these rejected claims, claim 1 is independent. Appellant respectfully traverses this rejection. Again, as a preliminary matter, Appellant notes that the Examiner incorrectly employs “Stanley” as the first listed inventor in attributing U.S. Patent No. 3,244,681 to Stanley et al.

Legal Precedent

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). To establish a *prima facie* case, the Examiner must not only show that a modified reference includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the reference. *See Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). The Examiner must provide objective evidence, rather than subjective belief and unknown authority, of the requisite motivation or suggestion to modify the cited reference. *See In re Lee*, 61 U.S.P.Q.2d. 1430 (Fed. Cir. 2002).

If the Examiner relies on a theory of inherency, the extrinsic evidence must make clear that the missing descriptive matter is *necessarily* present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. *In re Robertson*, 169 F.3d 743, 49 U.S.P.Q.2d 1949 (Fed. Cir. 1999). In relying upon the theory of inherency, the Examiner bears the evidentiary burden and must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art. *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

Independent Claim 1

The Examiner acknowledged that the cited reference does not disclose “a root mean square surface roughness less than about 120 micro inches,” as recited in claim 1. *See* Office Action Mailed July 10, 2006, page 4. Nevertheless, the Examiner incorrectly asserted that because Rohlfing discloses a tubular closed loop reaction zone having smooth surfaces, it would have been obvious to one of ordinary skill in the art to polish the inner surface of the Rohlfing loop reactor to a root mean square surface roughness less than about 120 micro inches. *See id.*, at 5. However, the Examiner did *not* provide objective evidence of such obviousness. Further, the Examiner apparently did not provide a modification of the reference. To be sure, the Examiner did not provide a convincing line of reasoning of any modification of the cited reference. Moreover, if the Examiner relied on the principle of inherency, he did not show that the Rohlfing surfaces *necessarily* possess a root mean square surface roughness less than about 120 micro inches. Clearly, in all respects, the Examiner has fallen short of meeting his evidentiary burdens.

The Examiner awkwardly contended that “although [Rohlfing] may not use the same units for measuring smoothness or roughness, applicants must recognize that the recited ‘root mean square surface roughness’ is merely a functional language for gauging roughness or smoothness that does not lend itself to patentability.” *See* Office Action Mailed July 10, 2006, page 4. First, Appellant notes that the cited reference employs no units for smoothness or roughness, but merely states that the surface of the Rohlfing reactor is smooth. *See* Rohlfing, col. 1, lines 60-65. Such a nonspecific statement in Rohlfing does not teach or suggest the polished-like finish of a surface having a roughness less than about 120 micro inches, as claimed. Further, as indicated in the present specification, Appellant believes that the walls of loop reactors (such as the Rohlfing reactor) in the prior art possess a roughness *greater* than 125 micro inches. *See* Application, page 7, ¶ 28. Indeed, Appellant believes that the roughness of the Rohlfing is well above 125 micro inches (far outside of the claimed range) when considering the age of the reference.

Second, Appellant traverses the Examiner’s contention that the presently-recited unit of roughness is merely functional language not lending itself to patentability. After all, a degree of smoothness (which may be expressed in units of roughness as is typical in the pertinent art) of a surface of the polymerization reactor is plainly patentable. The present application discloses and claims specific processes for conducting polymerizations in reactors having a maximum surface roughness, and also generating and maintaining such a maximum surface roughness. *See, e.g.,* Application, pages 4-5, ¶¶ 19-21.

In conclusion, while the Rohlfig reference mentions “a tubular closed loop reaction zone having smooth surfaces,” the cited reference is absolutely devoid of the teaching or suggestion of a loop reactor surface having a *root mean square surface roughness less than about 120 micro inches*. See Rohlfig, col. 1, lines 60-65. Accordingly, claim 1 and its dependent claims 2-6 are patentable over the cited reference. Therefore, Appellant respectfully requests that the Board direct the Examiner to withdraw the rejection and allow claims 1-6.

Third Ground of Rejection – Claim Rejection under 35 U.S.C. § 103(a)

The Examiner also rejected claims 7-11 and 17-22 under 35 U.S.C. § 103(a) as obvious over Rohlfig et al. (U.S. Patent No. 3,244,681). Of these rejected claims, claim 7 is independent. Appellant respectfully traverses this rejection.

Independent Claim 7

Independent claim 7 recites “a first polymerization step . . . to produce . . . solid olefin polymer particles having a melt index less than 0.3 gm/10 min; and a second polymerization step . . . to produce . . . solid olefin polymer particles having a melt index greater than 0.4 gm/10 min.” Initially, Appellant emphasizes that the Rohlfig reference does not teach or suggest these recited features. Further, the Examiner did *not* address the subject matter of independent claim 7. The Examiner *must* address the subject matter of independent claim 7 to reject claim 7 under Section 103. Indeed, to establish *prima facie* obviousness of a claimed invention, the Examiner must show that all the claim limitations are taught or are suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974); M.P.E.P. § 2144.03.

Appellant notes that the Examiner improperly formulated the rejection under Section 103 in stating “[i]n view of the 112 rejection set forth for claims 7-11 . . . the examiner has a reasonable basis to treat the recited two polymerization steps in claim 7 as one polymerization step.” *See* Office Action, page 6. To the contrary, the Examiner may not appropriately ignore features of the claim 7 in this context. *See* M.P.E.P. § 2173.06. As stated in the Manual of Patent Examining Procedure (M.P.E.P.), the fact that terms may be indefinite does not make the claim obvious over the prior art. *Id.* Again, all words in a claim must be considered in judging the patentability of a claim against the prior art. *Id.* (citing *In re Wilson*, 424 F.2d 1382, 165 U.S.P.Q. 494 (C.C.P.A. 1970)).

In conclusion, the Rohlfing reference is absolutely devoid of the presently-recited features, and the Examiner did *not* specifically address the subject matter of independent claim 7. Accordingly, Appellant again traverses this unsupported rejection of independent claim 7. Appellant respectfully requests that the Board direct the Examiner to withdraw the rejection and allow claims 7-11 and 17-22.

First and Second Grounds of Rejection – Independent Claims 1 and 7

In addition, with regard to both independent claims 1 and 7, the Examiner failed to provide a difference, a modification, and an explanation which would support an obviousness rejection and which might be responded to by Appellant. “It is important for an examiner to properly communicate the basis for a rejection so that the issues can be identified early and the

Applicant can be given a fair opportunity to reply.” M.P.E.P., §706.02(j). In this instance, Appellant is unfairly prejudiced by not being provided what the Examiner considers to be the distinction between the reference and the claims, the proposed modification, and the presumed suggestion or motivation to make the modification as provided by the reference. The failure of the Examiner to provide the noted information precludes a *prima facie* case of obviousness from being established.

Such a *prima facie* case must demonstrate some suggestion or motivation to modify the reference, a reasonable expectation of success, and that all the claim elements are taught or suggested by the prior art reference. M.P.E.P., §706.02(j). Appellant respectfully submits that the Examiner did not establish these required components of a *prima facie* case based on the Rohlfing reference. As discussed, the Rohlfing reference fails to teach or suggest all the elements of the instant claims. Further, there is no suggestion or motivation within the Rohlfing reference to modify the disclosed configuration to correspond to the recitations in the present claims. Likewise, considering the silence of the Rohlfing reference as to any suggestion to modify the disclosed configuration, the Rohlfing reference is also silent as to the likelihood of success of any such modification.

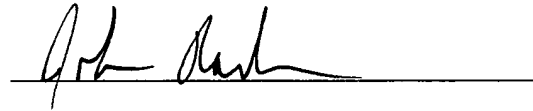
Accordingly, Appellant respectfully requests that Board direct the Examiner to withdraw the rejections under 35 U.S.C. § 103 and to allow pending claims 1-11 and 17-22.

CONCLUSION

Appellant respectfully submits that all pending claims are in condition for allowance. However, if the Examiner or Board wishes to resolve any other issues by way of a telephone conference, the Examiner or Board is kindly invited to contact the undersigned attorney at the telephone number indicated below.

Respectfully submitted,

Date: December 18, 2006

A handwritten signature in dark ink, appearing to read "John M. Rariden", is written over a horizontal line.

John M. Rariden
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8. **APPENDIX OF CLAIMS ON APPEAL**

1. (original) A polymerization process comprising:
polymerizing in a loop reactor having an inner surface, at least one olefin monomer in a liquid medium to produce a fluid slurry comprising solid olefin polymer particles in a liquid medium, wherein said inner surface of said loop reactor has a root mean square surface roughness less than about 120 micro inches.
2. (original) The process of claim 1 wherein said inner surface of said loop reactor has a root mean square surface roughness less than about 110 micro inches.
3. (original) The process of claim 1 wherein said inner surface of said loop reactor has a root mean square surface roughness less than about 90 micro inches.
4. (original) The process of claim 1 wherein said inner surface of said loop reactor has a root mean square surface roughness less than about 70 micro inches.
5. (original) The process of claim 1 wherein said inner surface of said loop reactor has a root mean square surface roughness less than about 50 micro inches.
6. (original) The process of claim 1 wherein said inner surface of said loop reactor has a root mean square surface roughness less than about 30 micro inches.

7. (original) A polymerization process comprising:
a first polymerization step comprising polymerizing in a loop reactor at least one olefin monomer in a liquid medium to produce a first product fluid slurry comprising a liquid medium and solid olefin polymer particles having a melt index less than 0.3 gm/10 min and
a second polymerization step comprising polymerizing in said loop reactor at least one olefin monomer in a liquid medium to produce a second product fluid slurry comprising a liquid medium and solid olefin polymer particles having a melt index greater than 0.4 gm/10 min.
8. (previously presented) The process of claim 7 wherein the solid olefin polymer particles produced in said first polymerization step have a melt index less than 0.2 gm/10 min.
9. (previously presented) The process of claim 7 wherein the solid olefin polymer particles produced in said first polymerization step have a melt index less than 0.1 gm/10 min.
10. (original) The process of claim 7 wherein the solid olefin polymer particles produced in said first polymerization step have a melt index less than 0.2 gm/10 min., and the solid olefin polymer particles produced in said second polymerization step have a melt index greater than 0.5 gm/10 min.

11. (original) The process of claim 7 wherein the solid olefin polymer particles produced in said first polymerization step have a melt index less than 0.1 gm/10 min., and the solid olefin polymer particles produced in said second polymerization step have a melt index greater than 0.5 gm/10 min.

12. – 16. (cancelled)

17. (original) The polymerization process of claim 7 wherein said loop reactor has an inner surface, said inner surface having a root mean square surface roughness less than about 120 micro inches.

18. (original) The polymerization process of claim 7 wherein said loop reactor has an inner surface, said inner surface having a root mean square surface roughness less than about 100 micro inches.

19. (original) The polymerization process of claim 7 wherein said loop reactor has an inner surface, said inner surface having a root mean square surface roughness less than about 90 micro inches.

20. (original) The polymerization process of claim 7 wherein said loop reactor has an inner surface, said inner surface having a root mean square surface roughness less than about 70 micro inches.

21. (original) The polymerization process of claim 7 wherein said loop reactor has an inner surface, said inner surface having a root mean square surface roughness less than about 50 micro inches.

22. (original) The polymerization process of claim 7 wherein said loop reactor has an inner surface, said inner surface having a root mean square surface roughness less than about 30 micro inches.

9. **APPENDIX OF EVIDENCE**

None.

10. **APPENDIX OF RELATED PROCEEDINGS**

None.